

**REMARKS**

This is intended as a full and complete response to the Final Office Action dated October 14, 2005, having a shortened statutory period for response with a one-month extension set to expire on February 14, 2006. Claims 1, 4-5, 7 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Juday (U.S. Patent No. 6,680,797) in view of Sorin (U.S. Patent No. 6,208,774). Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Juday in view of Lee (U.S. 6,522,467). Claims 3, 8-10 and 12-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Juday in view of Chen (U.S. Patent Application No. 2003/0103718).

Claim 1 recites the limitation that beam waists of the P-polarization beam and the rotated S-polarization beam are located substantially on a center of a liquid crystal cavity in the liquid crystal tunable filter. Neither Juday nor Sorin teaches or suggests this limitation.

In the Final Office Action, the Examiner readily admits that Juday fails to disclose this limitation (see page 4 of Final Office Action). However, in arguing that Figures 3 and 4 of Sorin teach this limitation, the Examiner states that “[s]ince the entire beam travels through the liquid crystal cavity” . . . “the beam waist travels through the cavity as well.” This position is simply unsustainable. As is well known in the art, the beam waist of a beam is defined as twice the radius of the beam’s irradiance contour at the location where the beam’s wavefront is flat (emphasis added). The beam waist has a fixed location – the beam waist does not “travel” or move in any way whatsoever with the beam, as suggested by the Examiner. As Applicant has previously contended, Sorin does not disclose anything about beam waists and has no specific teachings about locating the beam waists on the center of a liquid crystal cavity, as recited in claim 1. The Examiner cannot simply conclude that Sorin teaches this limitation because Figures 3 and 4 show two beams traversing a liquid crystal cavity. Such a conclusion plainly contravenes the established definition of a beam waist as commonly used in the field of Gaussian beam theory.

As explained in past responses, the specification of the present application makes clear that locating the beam waists on the center of the liquid crystal cavity reduces the parallelism requirement for a liquid crystal cavity, which is a stated advantage of the present invention. See Application page 7, line 18 – page 8, line 4. Since neither Juday nor Sorin teaches or suggests this limitation, the combination of these references cannot render claim 1 or claims 3-6,

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dependent thereon, obvious. For these reasons, Applicant submits that these claims are in condition for allowance.

Independent claims 7 and 11 recite limitations similar to the limitation discussed above in connection with claim 1. Therefore, claims 7 and 11 are condition for allowance for at least the same reasons as claim 1. Further, since claims 8-10 depend from allowable claim 7, and claims 12-14 depend from allowable claim 11, these claims also are in condition for allowance.

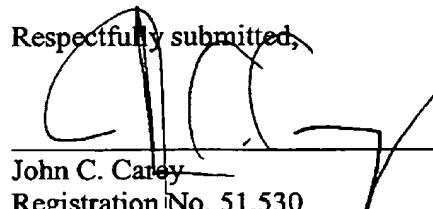
In addition, dependent claim 4 recites the limitations that the C-polarizer and the beam collimator are rotated to match the polarization orientation of the liquid crystal material inside the liquid crystal cavity. The Examiner argues that these limitations are "inherent" in liquid crystal filter designs. However, these limitations are not inherent because different types of liquid crystal filters require different types of alignments. For example, in a color mixer that allows half of the intensity of a fixed wavelength to pass and half of the intensity of a selectable wavelength to pass, the polarization planes are typically aligned at a 45 degree angle relative to the orientation of the liquid crystal. In such a filter, the orientations of the polarization planes and the liquid crystal are specifically not matched. Thus, the Examiner's conclusion that such orientation matching is inherent is incorrect. Since none of the cited reference teach or suggest the limitation of matching the polarization orientation of the liquid crystal, Applicant submits that claim 4 is in condition for allowance for this reason as well.

Finally, neither Lee nor Chen cures the deficiencies of Juday and Sorin set forth above. Thus, no combination of the references cited by the Examiner can render any of the pending claims obvious.

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Conclusion

Having addressed all issues set out in the Final Office Action, Applicant respectfully submits that the claims are in condition for allowance and respectfully requests that the claims be allowed.

Respectfully submitted,  
  
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